Exhibit 300: Capital Asset Summary

Part I: Summary Information And Justification (All Capital Assets)

Section A: Overview & Summary Information

Date Investment First Submitted: 2010-09-17
Date of Last Change to Activities: 2012-04-27
Investment Auto Submission Date: 2012-02-27
Date of Last Investment Detail Update: 2012-02-27
Date of Last Exhibit 300A Update: 2012-08-23
Date of Last Revision: 2012-08-23

Agency: 021 - Department of Transportation **Bureau:** 12 - Federal Aviation Administration

Investment Part Code: 01

Investment Category: 00 - Agency Investments

1. Name of this Investment: FAAXX800: NextGen R&D Trajectory Based Operations (TBO)

2. Unique Investment Identifier (UII): 021-271423723

Section B: Investment Detail

1. **Provide a brief summary of the investment, including a brief description of the related benefit to the mission delivery and management support areas, and the primary beneficiary(ies) of the investment. Include an explanation of any dependencies between this investment and other investments.**

NextGen is a series of inter-linked programs, systems, and policies that implement advanced technologies and capabilities to dramatically change the way the current aviation system is operated. NextGen is satellite-based and relies on a network to share information and digital communications so all users of the system are aware of other users' precise locations. Trajectory-Based Operations (TBO) is a portfolio of research and development projects focused on improving efficiency of operations. Aircraft will be assigned to fly negotiated trajectories, which allows airspace to be used more efficiently. Computer automation—ground and airborne—creates these trajectories, and the trajectories are exchanged with aircraft by DataComm, a data link system that can automatically transmit data from FAA facilities to aircraft and receive return messages. ADS-B continually updates the aircraft position so the controller can determine whether the aircraft will remain free of conflicts with other aircraft and restricted airspace. Key elements in making TBO work are the accurate exchange of complex information that DataComm provides and FAA's ability to negotiate via DataComm with pilots on how to maneuver if they have to deviate from their approved trajectory. This solution set focuses primarily on en route cruise operations, although all phases of flight will benefit from TBO. This program is a Research and Development (R&D) effort that is currently in the planning phase and therefore final beneficiaries and dependencies have not been formally established and are subject to change. Such beneficiaries and dependencies will be clearly

identified for NextGen transformational programs that are reported in their own Exhibit 300.

2. **How does this investment close in part or in whole any identified performance gap in support of the mission delivery and management support areas? Include an assessment of the program impact if this investment isn't fully funded.**

TBO will increase efficiency and reduce congestion across the NAS. Delegated Responsibility for In-Trail Separation would allow pilots, when authorized by the controller, to maintain safe spacing with other aircraft. The aircraft would have to be equipped with Cockpit Display of Traffic Information (CDTI) and Automatic Dependent Surveillance – Broadcast (ADS-B). The CDTI would display surrounding aircraft to pilots. Air traffic control facilities would have to be equipped with the En Route Automation Modernization (ERAM) mid-term work package and ADS-B display capability so controllers could monitor separation. Oceanic In-Trail Climb and Descent, when authorized by the controller, would allow aircraft to safely reduce separation from the aircraft in front of them for quicker entry to their desired altitude on climb and fly more optimal descent profiles on arrival to save fuel. The aircraft would have to be equipped with ADS-B and ADS-C and Controller Pilot Data Link Capability (CPDLC) and meet Required Navigation Performance 4 (RNP 4). Automation Support for Separation Management would provide controllers with the tools to manage aircraft with differing navigation capabilities and provide safe separation when following aircraft are affected by the wake turbulence of an aircraft in front of them. The ERAM D-position upgrade and system enhancements will have to be operational. The following are planned improvements in the TM Synchronization/Trajectory Management services area: Initial Conflict Resolution Advisories are an enhancement to the existing conflict probe software to provide rank-ordered advisories to the controller to better accommodate pilot requests for trajectory changes. FAA facilities must be equipped with the ERAM D-position upgrade and system enhancements; the upgraded Weather and Radar processing system (WARP); the 4-dimensional Weather Cube; and in the latter stages the NextGen Weather Processor. Flexible Entry Times for Oceanic Tracks will allow aircraft to reach their preferred trajectories sooner, which will minimize fuel burn. Point-in-Space Metering uses scheduling tools to ensure smooth flow of traffic and efficient use of airspace. Pilots are assigned a specific trajectory and scheduled times to reach specific points on the assigned trajectory. This maximizes use of airspace by reducing the need to alter aircraft flight paths to maintain separation. Reducing funding would delay benefits beyond the 2012-2018 plan.

3. **Provide a list of this investment's accomplishments in the prior year (PY), including projects or useful components/project segments completed, new functionality added, or operational efficiency achieved.**

Major activities the program accomplished in FY11: Delivered Concept of Operations for In-Flight Operations Re-Profile Alert capability as part of the operational Trial for Oceanic Tactical Trajectory Management Operations; Integrated ADS-B Point of Service (POS) delivery for UAS; Conducted ADS-C Climb Descend Procedure (CDP) Ops Trial and completed Concept of Operations document (Re-Profile Alert) for oceanic tactical trajectory management; Developed and delivered Safety Assessment Plan and published Draft Independent Engineering Assessment for Conflict Resolution Advisories; Delivered business case analysis report (BCAR) and implementation strategy and planning (ISP) document for ERAM D position upgrade and system enhancements for separation management; Completed First Phase (FMC Route Offset, SAC, RA Position, Conflict Probe at Radar

Position, Strip-less Non-Radar Operations) concept of use document.

4. **Provide a list of planned accomplishments for current year (CY) and budget year (BY).**

• FY12: Trajectory Management-Oceanic (OTTM) - Continue ADS-C Climb Descent Procedures (CDP); ADS-C Lateral Procedures (LP); Web-Enabled Collaborative Trajectory Planning (WE-CTP), Trajectory Feedback Transition Package, Automation for Trajectory Optimization Transition Package, Re-profile Alert Tool Initial System Requirements. Separation Management-Modern Procedures (D & R side): Continue prototyping of D-side redesign; continue prototyping of selected NSIP Alpha separation management enhancements to include conformance monitoring for Area Navigation / Required Navigation Performance (RNAV/RNP) flights on RNAV/RNP routes; continue pre-implementation activities including operational risk reduction, concept validation/documentation, prototype demonstration for technical risk reduction, technology transfer from research organizations, and pre-production prototyping of key technical components. Capacity Management - NextGen DME- Continue DME acquisition activities, Conduct Investment Analysis activities for NextGen DME program. Trajectory Management - Conflict Resolution Advisories: Build 1 capability requirements document and validation report, Cost Benefit analysis report, Concept of Operations Document. • FY13: Trajectory Management-Oceanic (OTTM) - Continue ADS-C Climb Descent Procedures (CDP); ADS-C Lateral Procedures (LP); Web-Enabled Collaborative Trajectory Planning (WE-CTP). Oceanic Trajectory Management-4D: Pre-Departure Optimization (Pre-Departure Planner), Flight-Specific Likelihood Feedback Capability, Portfolio of Controller Enhancements; Ops trial planning and execution with enhanced controller procedures for Enhancement #1, Operational Capabilities for Strategic Trajectory Coordination. Separation Management-Modern Procedures (D & R side): Pre-implementation activities: Continue evolving En Route NextGen Mid-Term Baseline capabilities. Conformance monitoring for Area Navigation / Required Navigation Performance (RNAV/RNP) flights on RNAV/RNP routes. Integration of manual trial planning on the radar console. Evolving separation automation capabilities supporting Operational Improvements (OIs). Capacity Management-NextGen DME: Continue DME acquisition activities, DME production, and DME procurement, conduct Investment Analysis activities for NextGen DME En Route program and complete FID. Trajectory Management-Conflict Resolution Advisories-Complete technology transfer of previous collected work on conflict advisories.

5. **Provide the date of the Charter establishing the required Integrated Program Team (IPT) for this investment. An IPT must always include, but is not limited to: a qualified fully-dedicated IT program manager, a contract specialist, an information technology specialist, a security specialist and a business process owner before OMB will approve this program investment budget. IT Program Manager, Business Process Owner and Contract Specialist must be Government Employees.**

2011-03-01

Section C: Summary of Funding (Budget Authority for Capital Assets)

1.

Table I.C.1 Summary of Funding

	PY-1 & Prior	PY 2011	CY 2012	BY 2013
Planning Costs:	$95.1	$39.6	$7.0	$16.5
DME (Excluding Planning) Costs:	$0.0	$0.0	$0.0	$0.0
DME (Including Planning) Govt. FTEs:	$0.0	$0.0	$0.0	$0.0
Sub-Total DME (Including Govt. FTE):	$95.1	$39.6	$7.0	$16.5
O & M Costs:	$0.0	$0.0	$0.0	$0.0
O & M Govt. FTEs:	$0.0	$0.0	$0.0	$0.0
Sub-Total O & M Costs (Including Govt. FTE):	0	0	0	0
Total Cost (Including Govt. FTE):	$95.1	$39.6	$7.0	$16.5
Total Govt. FTE costs:	0	0	0	0
# of FTE rep by costs:	0	0	0	0
Total change from prior year final President's Budget ($)		$-7.0	$-16.0	
Total change from prior year final President's Budget (%)		-15.11%	-69.57%	

2. If the funding levels have changed from the FY 2012 President's Budget request for PY or CY, briefly explain those changes:

FY12 funding reduced due to FY12 appropriation adjustment as well as removal of DOT infrastructure adjustment.

Section D: Acquisition/Contract Strategy (All Capital Assets)

Table I.D.1 Contracts and Acquisition Strategy

Contract Type	EVM Required	Contracting Agency ID	Procurement Instrument Identifier (PIID)	Indefinite Delivery Vehicle (IDV) Reference ID	IDV Agency ID	Solicitation ID	Ultimate Contract Value ($M)	Type	PBSA ?	Effective Date	Actual or Expected End Date
Awarded		DTFAWA-10-R-00834									
Awarded		H.S.I. SE-2020 DTFA01-10-D-00033/Task Order 5									

Solicitation ID	Type of Contract/Task Order (Pricing)	PBSA	Effective date	Extent Competed	Short description of acquisition
	Labor Hours	X	2012-04-19	U	4521052920!BOA

Awarded		ERAM DTFA01-03-C-00015/Task Order 51									
Awarded		DTFA01-10-C-00080 (MITRE CAASD) Vehicle Not Task/Del. Order Specific									
Awarded		TASC DTFAWA-03-C-00071/Task Order 7113									
Awarded		DTFAWA-10-A-80000 Appendix Task F									
Awarded		DTFAWA-10-A-80000 Appendix Task									

		J		
Awarded		DTFACT-06-D-00003 DO#0002 (2012 Engineering Support)		
Awarded		DTFA01-01-C-00030 (DTFAWA10F00077) (MIT via NEXTOR)		
Awarded		DTFACT-10-C-00028		
Awarded		DTFAWA-10-D-00016 (CSSI)		

2. If earned value is not required or will not be a contract requirement for any of the contracts or task orders above, explain why:
FAA's AMS includes policy and guidance on the utilization of EVM, and EVM is applied to NextGen investments in accordance with this policy. Once programs are approved and baselined, EVM is conducted in accordance with FAA and DOT policy. Investments described in this Exhibit are managed in the NextGen Portfolio Management Framework which requires project level agreements (PLAs) that document project scope, purpose, planned cost, major milestones and relationships to other programs and the NAS EA. This information is maintained in an automated tool where project managers provide monthly status on activities. The data maintained in the tool provides an annual master milestone list and current status information. For each activity a project plan and a supporting project schedule are developed to document major milestones, decisions and deliverable.

Exhibit 300B: Performance Measurement Report

Section A: General Information

Date of Last Change to Activities: 2012-04-27

Section B: Project Execution Data

Table II.B.1 Projects

Project ID	Project Name	Project Description	Project Start Date	Project Completion Date	Project Lifecycle Cost ($M)
G01A0101	Separation Management - Modern Procedures	The performance-based concept calls for separation standards to vary according to aircraft capabilities and pilot training. This effort will result in a set of separation standards requirements and algorithms to implement them. This includes changes to automation, procedures, and training. This also funds an analysis of performance-based data processing to see if it is appropriate for lowering separation minima. Performance-based data processing is a way to integrate all information about an aircraft's path and location to provide full situational awareness and predict possible problems. Developing new automation Conflict Alert (CA) and Conflict Probe (CP) algorithms and changing the controller workstations to support the new information are on the critical path of many NextGen			

Table II.B.1 Projects

Project ID	Project Name	Project Description	Project Start Date	Project Completion Date	Project Lifecycle Cost ($M)
		technologies.			
G01A0102	Separation Management - High Altitude	This will develop the mid-term automation decision support tool and display requirements for air traffic controller separation management in high altitude trajectory based airspace. It will identify cognitive support and display change requirements for early transition to a high altitude specialty and will develop and validate automation changes needed to implement a new high altitude operating concept that will create a more flexible high altitude airspace concept by increasing staffing flexibility, reducing training time, and enabling traffic peaks to be handled by fewer controllers. Initial operational concept development and validation efforts have concluded that in high altitude airspace, the local knowledge information needed is considerably less than in lower altitude airspace and that different operating strategies can be used to more dynamically adjust staffing and airspace to meet demand and reduce operating costs. By providing local knowledge through information accessible through the controller display and other tools, there will be increased flexibility in the assignment of airspace to controllers, increasing overall productivity and flexibility to deal with weather and congestion events. This activity will work to define and develop the information display and			

Table II.B.1 Projects

Project ID	Project Name	Project Description	Project Start Date	Project Completion Date	Project Lifecycle Cost ($M)
		decision support tool changes to provide this local knowledge and conduct human-in-the-loop simulations with controllers to assess the effectiveness of the information content and automation and display changes to enable rapid training (in terms of hours) of controllers to safely and efficiently control the airspace.			
G01A0103	Separation Management - Automation Risk Mitigation	This activity will support the assessment and risk mitigation activities for interfacing automation systems in support of the Advanced Automatic Dependent Surveillance-Broadcast (ADS-B) applications.			
G01A0202	Trajectory Management - Oceanic Tactical Trajectory Management	The Oceanic Tactical Trajectory Management program is a critical NextGen capability that addresses current performance gaps in the areas of capacity, productivity, efficiency, safety, and environmental impacts in the oceanic environment. FY12 will be used to address the three initial Oceanic TBO initiatives: Automatic Dependent Surveillance (ADS) Climb and Descent Procedures (CDP), Pre-Departure and Web-Enabled CTP, and In-Flight Operations. Based on the results of the FY11 work, FY12 will be used to expand these initiatives to other geographical areas, perform operational trials, further refine longer-term objectives, include new initiatives to investigate separation assurance systems using Automatic Dependent			

Table II.B.1 Projects

Project ID	Project Name	Project Description	Project Start Date	Project Completion Date	Project Lifecycle Cost ($M)
		Surveillance (ADS) technology, and begin concept development activities for Oceanic Airspace Management, Trajectory Managed, Autonomous, and Mixed Classic Airspace.			
G01A0203	Trajectory Management - Conflict Resolution Advisories	This effort includes the analysis, prototyping, pre-implementation activities and software development activities to implement conflict resolution advisories. Conflict resolution advisories will first be implemented using voice and data in a mixed equipage environment, and ultimately will be transmitted solely via data in certain airspace. The implications for changing controller roles and responsibilities will be explored and the requirements for automation, decision support systems and data communications will be identified. High performance aircraft will directly connect via air-ground data communications to the flight management system, facilitating electronic data communications between the Air Traffic Control (ATC) automation and the flight deck automation. As a first step and in mixed performance airspace, the controller will still be responsible for aircraft separation by responding to problems predicted by the ATC automation. Instead of monitoring the sector airspace display to predict potential problems and mentally calculating problem resolutions, the automation will not only predict the problems but			

Table II.B.1 Projects

Project ID	Project Name	Project Description	Project Start Date	Project Completion Date	Project Lifecycle Cost ($M)
		determine the best solution. The controller will transmit the solution via voice initially, and then via data link. This level of automation support helps manage controller workload as a means of safely dealing with the predicted increases in traffic volume. This activity will prototype earlier and easier resolutions capabilities (such as pre-probed altitude and speed amendments) that can be transferred verbally by controllers and evaluate the impact these have on the Computer Human Interface (CHI) design and system performance and conduct research into more complex issues for future implementation such as vector advisories as well as the role of the human versus automation in voice clearance, mixed voice and data communications environments, and data communications only.			
G01N0101	Capacity Management - NextGen Distance Measuring Equipment (DME)	This program will provide near-term support for trajectory-based and performance-based operational requirements and will be functionally capable of providing the signal in space to fill the coverage gaps and meet the redundancy requirements for new Global Positioning System (GPS)/Area Navigation (RNAV)/Required Navigation Performance (RNP) procedures. This Distance Measuring Equipment (DME) will have availability greater than 99.95			

Table II.B.1 Projects

Project ID	Project Name	Project Description	Project Start Date	Project Completion Date	Project Lifecycle Cost ($M)
		percent, a mean time to repair of less than one-half hour, a mean time between failures of 14,231 hours, and a mean time between outages of 15,193 hours. It will be configurable for low, intermediate, and high power with single or dual equipment and will be commissioned accordingly. The functionality of this DME, while providing a higher transponder capacity, better reliability/maintainability, and the most current solid state technology, is exactly the same as the DMEs currently in the NAS. The most important function of the DME is the reply delay requirement used by the airborne interrogator to obtain slant range. This function has been consistent since the 1950s and will continue to be consistent in this DME.			

Activity Summary

Roll-up of Information Provided in Lowest Level Child Activities

Project ID	Name	Total Cost of Project Activities ($M)	End Point Schedule Variance (in days)	End Point Schedule Variance (%)	Cost Variance ($M)	Cost Variance (%)	Total Planned Cost ($M)	Count of Activities
G01A0101	Separation Management - Modern Procedures							
G01A0102	Separation Management - High Altitude							
G01A0103	Separation Management - Automation Risk Mitigation							

Activity Summary

Roll-up of Information Provided in Lowest Level Child Activities

Project ID	Name	Total Cost of Project Activities ($M)	End Point Schedule Variance (in days)	End Point Schedule Variance (%)	Cost Variance ($M)	Cost Variance (%)	Total Planned Cost ($M)	Count of Activities
G01A0202	Trajectory Management - Oceanic Tactical Trajectory Management							
G01A0203	Trajectory Management - Conflict Resolution Advisories							
G01N0101	Capacity Management - NextGen Distance Measuring Equipment (DME)							

Key Deliverables

Project Name	Activity Name	Description	Planned Completion Date	Projected Completion Date	Actual Completion Date	Duration (in days)	Schedule Variance (in days)	Schedule Variance (%)

NONE

Section C: Operational Data

Table II.C.1 Performance Metrics

Metric Description	Unit of Measure	FEA Performance Measurement Category Mapping	Measurement Condition	Baseline	Target for PY	Actual for PY	Target for CY	Reporting Frequency
NONE								